Discriminant Validity of the Adult Attachment Interview

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CROWELL, JUDITH A.; WATERS, EVERETT; TREBOUX, DOMINIQUE; O'CONNOR, ELIZABETH; COLON-DOWNS, CHRISTINA; FEIDER, OLGA; GOLBY, BARBARA; and POSADA, GERMAN. *Discriminant Validity of the Adult Attachment Interview.* CHILD DEVELOPMENT, 1996, 67, 2584–2599. The Adult Attachment Interview is a semi-structured interview developed to investigate adults' attachment representations. Subjects are asked to describe their parents as caregivers, explain these descriptions, describe how their parents typically responded to distress, and discuss their current relationships with their parents. They are also asked to describe any significant losses and/or instances of abuse during childhood. Scoring focuses on the accessibility of early experiences to memory and the coherence and plausibility of the subject's narrative. Discriminant validity is always an important issue with such measures because IQ and other cognitively loaded variables offer plausible alternative interpretations or represent important correlates that should be treated as covariates when the measure is used. In addition, complex, multifaceted interviews always pose the risk of assessing general social adjustment rather than a more narrowly defined construct. This study examines the discriminant validity of the AAI vis-à-vis intelligence, social desirability, discourse style, and general social adjustment in a sample of 53 native-English-speaking, married women with preschool children. They were assessed with the AAI, a written IQ test, the Social Adjustment Scale, the Employment Experience Interview (discourse style), and a measure of social desirability. There were modest but significant correlations with IQ scores and social adjustment. There was no relation between AAI classifications and discourse style or social desirability. These results substantially strengthen the case for interpreting the AAI as an attachment-related measure.

Attachment theorists use the term "working model" to refer to mental representations or belief systems derived from attachment-related experiences. Such representations are said to organize attachment relevant feelings, experiences, and thoughts and to guide appraisal processes and behavioral responses to new experiences (Bretherton, 1985). The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) is a semi-structured interview developed to investigate adults' attachment representations. Subjects are asked to describe their parents as caregivers, explain these descriptions, describe how their parents typically responded to distress, and discuss their own current relationships with their parents. They are also asked to describe any significant losses and/or instances of abuse during childhood. Scoring focuses on the accessibility of early experiences to memory and the coherence and plausibility of the subject's narrative. Although the language and discourse style elicited in the AAI do not specify the content of an adult's attachment working model, accessibility of early experiences, coherence,

and plausibility are assumed to reflect the internal consistency, extensibility, and testability of the underlying belief system (Bowlby, 1973, 1980, 1982; Bretherton, 1985).

Discriminant validity is always an important issue with such measures because IQ and other cognitively loaded variables offer plausible alternative interpretations or represent important correlates that should be treated as covariates when the measure is used. In addition, complex, multifaceted interviews always pose the risk of assessing general social adjustment rather than a more narrowly defined construct. As with the Strange Situation in the mid 1970s, studies of the AAI's reliability and stability (Bakermans-Kranenburg & van IJzendoorn, 1993; Benoit & Parker, 1994; Crowell, Waters, Treboux, O'Connor, & Colon-Downs, 1995; Fonagy, Steele, & Steele, 1992; Sagi et al., 1994) and convergent validity (Ainsworth & Eichberg, 1991; Crowell & Feldman, 1988, 1991; Fonagy et al., 1992; Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988; Main, Kaplan, & Cassidy, 1985; Posada, Waters, & Crowell, 1995; van IJzendoorn, 1992) have proceeded far in advance of detailed studies on its discriminant validity. To date, only Bakermans-Kranenburg and van IJzendoorn (1993) and Sagi et al. (1994) have examined the discriminant validity of the AAI, both in non-English-speaking samples. The present study examines the discriminant validity of AAI classifications and scale scores vis-à-vis intelligence, social desirability, discourse style, and general social adjustment in a sample of native-English-speaking married women with children.

Issues in the Interpretation of AAI Classifications

Intelligence.—The first discriminant question addressed is whether the AAI is significantly influenced by intelligence or verbal ability. A subject's ability to speak in an organized, coherent, thoughtful, free-flowing manner about early experiences with parents is a key factor in determining attachment classification (Main & Goldwyn, 1994). Hauser (1976, 1992) and Borman, Allen, Cole, and Hauser (1996) have reported that AAI discourse coherency is related to educational level and also to ego development, a construct known to correlate significantly with intelligence (Hauser, 1976). In contrast, several studies have found that AAI classifications and scale scores are unrelated to intelligence tests (Bakermans-Kranenburg

& van IJzendoorn, 1993; Rosenstein & Horowitz, 1993; Sagi et al., 1994; Ward, Botyanski, Plunket, & Carson, 1991).

These findings suggest that the relation between the AAI and intelligence needs further investigation. For example, the coherency score and the classification system, although highly related, may have different correlates. There are also circumstances in which intelligence or education may play a role in attachment security, for example, in those individuals termed "earned secure" who have been able to overcome the effects of negative childhood experiences with parents and are scored as secure based upon their high coherence scores (Liu, Colon-Downs, Lord, Wang, & Crowell, 1995; Masten, Best, & Garmezy, 1990; Pearson, Cohn, Cowan, & Cowan, in press).

This is an important issue because the complexity of the AAI and the emphasis on language and cognition in the scoring system lend themselves to intrusion of intelligence-related variance. In addition, many of the stability results and competence related correlates of the AAI are consistent with this. A strong relation between AAI scoring and IQ would raise serious questions about the attachment-relatedness of the AAI. Modest correlations would suggest measuring IQ as a covariate in research with the AAI.

Trait-like discourse style.—The classifications of the AAI are determined by careful examination of the adult's discourse style on the topic of childhood attachment experiences. It is important to determine if the discourse style or manner of speech scored in AAI represents a broad cognitive style. Specifically, does inability to speak coherently, clearly, and consistently in an AAI interview reflect problems in an underlying attachment working model or simply an inability to speak well about any topic? Our strategy for assessing this is to conduct an interview about employment experience during adolescence and early adulthood and score the transcripts using coherence, clarity, and consistency criteria that parallel standard AAI scoring.

Social desirability.—It has long been known that there are reliable trait-like individual differences in the extent to which subjects present themselves in a positive light in self-report questionnaires and interviews. The AAI addresses a wide range of self-related issues that have both personal and social significance to the subject and the subject's appearance to the interviewer.

Thus intrusion of social desirability variance into the interview seems likely. The issue, of course, is whether such variance influences the AAI scoring system.

It is possible that this issue has received little attention in previous research (see Bakermans-Kranenburg & van IJzendoorn, 1993) because attachment theorists consider working models to exist outside of consciousness (Bowlby, 1988) and because the AAI is specifically intended to "surprise the unconscious" (George et al., 1985). Responses to the interview are taken to be spontaneous and reflect cognitive constructs operating out of conscious awareness and not calculated to make a specific impact on the interviewer. Nonetheless, because social desirability responding is both reliable and stable and has a wide range of competence-related correlates, many of the stability results and competence-related correlates of the AAI lend themselves to a social desirability interpretation. We address this issue by including a standard self-report measure of social desirability response set in our assessment.

Social adjustment.—The AAI delves deeply into family relationships in order to assess the subjects' mental representations and expectations of primary attachment figures. Both common sense and a wide range of research attest to the negative effects of psychopathology on family relationships. This raises the possibility that some of the information elicited in the AAI reflects broadly defined problems in social adjustment rather than specifically attachment-related problems.

A primary function of early attachment relationship is to support social explorations and acquisition of social skills and experience (Allen & Crowell, 1995; Bretherton, 1985; Waters & Sroufe, 1983). A wide range of studies has demonstrated that early attachment security is empirically related to social competence and social adjustment in childhood and adolescence (Elicker, Englund, & Sroufe, 1992; Kerns, 1995; Waters, Wippman, & Sroufe, 1979). Thus a small to moderate relation between attachment security and social adjustment in a nonclinic sample with ordinary life circumstances can be anticipated on theoretical and empirical grounds. Nonetheless, neither skill deficits and adjustment problems in nonclinic samples nor the social behavior correlates of clinical problems in childhood are viewed as primarily disorders of attachment. Thus, a

strong relation between the AAI and general social adjustment would raise a serious issue of discriminant validity. As with IQ and social desirability, individual differences in social adjustment are reliable and stable and, by definition, have a wide range of competence-related correlates. Thus they, too, might offer an alternative interpretation or contribute significantly to important AAI results. We address this issue by including in our assessments an interview measure of social adjustment.

In summary, the goal of this study is to determine whether the AAI is related to intelligence, discourse style, social desirability, and/or social adjustment in ways that would affect our understanding and interpretation of past studies or the use of the AAI in the future.

Method

Subjects

Participants were 53 mothers of preschool children. The children did not participate in this study. One woman was Asian-American, the remainder were White. Their mean age was 34.5 years (range 25.4–43.5 years). Using Hollingshead's (1975) ratings, they were from middle- to upper-middle income families, and their median occupational status (based upon the women's most recent employment outside of the home) was a score of 6 (e.g., technician, semi-professional, or small business owner), as was that of their spouses. Forty-nine of the women were married with their husbands living at home, and on average they had two children (range = 1–5). The average education level was 14 years; 26 of the participants reported working outside the home at least part-time at the time of the study (n = 11 part-time, n = 15 full time). The sample is comparable to other samples of nonclinical mothers in which the AAI has been used (van IJzendoorn & Bakermans-Kranenburg, 1996).

Measures

Assessment of adult attachment representations: Adult Attachment Interview (AAI; George et al., 1985).—The AAI is a 45–100-min interview. The subject is asked to give an overview of the childhood relationship with her parents and to provide sets of five adjectives which describe her childhood relationship with each parent. She is then asked to cite incidents or experiences from childhood that illustrate or explain the choice of each adjective. The subject is

asked about feelings of rejection, experiences of being upset, ill, and hurt, about separations, losses, and abuse. The subject is also asked to discuss changes in the relationships with her parents since childhood, to describe her current relationship with her parents, and to explain her understanding of their behavior. Finally, the subject is asked about the effects of early childhood experiences on her adult personality and parenting as well as her concerns and hopes for her own children. In scoring the interviews, special attention is paid to the coherence and consistency between the general descriptions and explanations of the relationships and specific examples of behavior and experiences.

The interviews were scored from typed transcripts from which all identifying names and places were deleted (Main & Goldwyn, 1991). Transcripts are scored on a set of nine-point scales which summarize the scorers' evaluations of the subject's childhood experiences with each parent (loving behavior, rejection, involving/role reversing behavior, neglect, and pressure to achieve) and the subject's present state of mind with respect to attachment (discourse coherence of transcript, believability, amount of information, relevance to topic, manner, idealization of each parent, stated lack of recall, current preoccupying anger toward each parent, derogation of each parent and of attachment, passivity of speech, and fear of loss of child through death). The state of mind variables contribute to an overall discourse coherence rating which is closely related to the subject's classification as secure or insecure with respect to attachment (Ffyfe & Waters, 1996). For this reason, the discriminant validity of the discourse coherence scale is examined along with the attachment classifications in the present analyses.

Based on the overall pattern of the interview and guided by scale ratings, the subject is assigned to one of three classifications: (1) Secure/autonomous with respect to attachment, (2) Dismissing of attachment, or (3) Preoccupied with attachment. In addition to the primary attachment classification, subjects scoring 6 or more on a nine-point Unre-

solved Loss scale or Unresolved Trauma scale are designated Unresolved. Table 1 summarizes the criteria for each attachment classification.

Scoring was conducted by coders trained by Mary Main and Eric Hesse (JC and DT), and interrater agreement was assessed using 23 of 53 transcripts (43%). Agreement for this sample on the three major attachment classifications was 81%, $k = .64$, $p < .001$, and 78% for four classifications, $k = .67$, $p < .001$. Rater agreement for the discourse coherence scale was $r = .86$, $p < .001$.

Disagreements between coders were resolved by conference. The distribution of three classifications was secure, 58% ($n = 31$); dismissing, 30% ($n = 16$); preoccupied, 11% ($n = 6$), and for four classifications was secure, 51% ($n = 27$); dismissing, 26% ($n = 14$); preoccupied, 8% ($n = 4$), and unresolved, 15% ($n = 8$). This distribution is similar to that reported in a meta-analysis of previous studies using the AAI (van IJzendoorn & Bakermans-Kranenburg, 1996).

Intelligence: The Henmon-Nelson Test of Mental Ability (Lamke & Nelson, 1973).—This measure is a timed, paper-and-pencil measure of general intellectual ability. It is an established measure, most recently standardized in 1973, which yields a single score (for reviews, see Buros, 1965; Jensen, 1980; Thorndike, Cunningham, Thorndike, & Hagen, 1991). This 90-item multiple-choice test includes vocabulary, patterns of number sequences, and analogies and can be administered in less than 20 min. Alpha reliabilities range between $r = .85$ and $r = .95$ (Thorndike et al., 1991). Henmon-Nelson scores correlate well with other group test assessments of intelligence, with grades and achievement tests, and the IQ score can be used as a basis for estimating WAIS Full Scale IQ scores (Kling, Davis, & Knost, 1978; Sternberg, Conway, Ketron, & Bernstein, 1981; Thorndike et al., 1991).

Subjects were allowed 15 min to work on the test, and raw scores were used in the analyses.[1] The range of items completed

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[1] Speed tests are administered to prevent the achievement of perfect scores; hence, reducing the time allowed for the test makes it more difficult to achieve a perfect score (Anastasi, 1982). Reducing the time of a test may lower the scores of certain individuals who require more time (personal speed is independent of intelligence, Jensen, 1980). However, timing is not a highly critical factor (subject's rank is largely unaffected) in tests where "the items are evenly graded in difficulty, have plenty of 'top' items, . . . 'fast' subjects can finish although they reach their difficulty ceiling before the end of the test"; furthermore, the test should not be so short that

TABLE 1
ADULT ATTACHMENT PATTERNS (Main & Goldwyn, 1994)

	Secure	Dismissing	Preoccupied	Unresolved
Past experiences	Loving, supportive parents OR any type of negative experience	Parents rejecting of attachment Pushed to be independent	Role-reversing parenting Tied to parents by guilt or overinvolvement	Loss of significant attachment figure Physical/sexual abuse
Present state of mind	Acknowledge importance of early relationships in personal development Balanced and empathic view of self and parents Affectively rich Clear and coherent	Minimizes or denies effects of early experiences Idealization of parents Poor recall Emphasis on personal strength Incoherent: lack of evidence, distant, terse	Preoccupied with parents Active anger at parents OR still attempting to please Confusion and ambivalence Incoherent: unclear, irrelevant	Disbelief of occurrence Feelings of causality Disoriented/disorganized speech Psychologically confused statements

within the 15-min time frame was 30–90 items, with a median number of 62 items completed and a mean of 63.6. The range of items correctly answered (raw scores) was 20–85, with a median of 50 items correct and a mean of 52.8.

Discourse style: The Employment Experience Interview (EEI).—The Employment Experience Interview (Crowell, Treboux, & Waters, 1992) is a semi-structured interview developed for this study. It covers the subjects' opinions and conceptualizations of their education and employment history. The purpose of the interview was to examine subjects' discourse style using a format and scoring system similar to that of the AAI but concerning a domain theoretically unrelated to attachment.

Subjects were asked a series of questions regarding their educational and employment history, for specific memories of employment-related events, and about the meaning and importance of work in their lives. They were also asked about periods out of work, job loss, jobs for which they were most and least suited, and their future goals. As much as possible, the interview avoided eliciting discussion of interpersonal relationships in the workplace so as to minimize overlap of topic with the AAI. Homemaking was considered a form of employment. When discussing homemaking in the interview, the interviewer maintained the focus on activities rather than discussing specific characteristics of the relationships with husband and children, again with the purpose of keeping content distinct from the AAI.

The interviews were transcribed and, as with the AAI, all identifying names and places were deleted from the typed copy. Each interview was rated on 13 five-point scales (Crowell et al., 1992). Seven scales reflect feelings and attitudes about educational/work related experiences: balance between work and home, investment in work, organized approach to employment-related decisions, satisfaction with the current work situation, realistic evaluation of performance, sense of achievement or personal growth, and perceived employment-related pressures. Seven scales were derived from the AAI scoring system and reflect discourse style: coherency of transcript, insistence

upon inability to recall events, active anger expressed, passivity of discourse/thought, idealization, and disorganized or disoriented responses to work-related trauma.

Based on the overall pattern of the interview and guided by scale ratings, subjects were assigned to one of four groups: (1) Integrated about work, (2) Overinvolved with work or 'overemphasis on employment-related experiences, (3) Uninvolved with work, and (4) Aimlessness/disorganization in the approach to work. Subjects classified as *Integrated* were characterized by their ability to put forward a coherent, organized discussion about their work-related experiences. They openly discussed the balance between work and home life, had primarily positive work experiences, but any dissatisfaction or work-related problem was clearly and directly discussed. Subjects classified as *Overinvolved* were characterized by a preoccupation with their job or some aspect of it. The subjects tended to have difficulty maintaining a balanced discussion because the focus was continuously drawn to the job. They tended to be pressured or worried about their job, and their discourse was characterized as angry, pressured, or having an enthusiastic overly childish quality. Subjects classified as *Uninvolved* tended to dismiss or derogate their work or some aspect of it or idealized their jobs as being fine or typical without evidence for this characterization. In either case, the subjects had little apparent investment in their jobs, presenting past and current jobs as irrelevant or unimportant and demonstrating a minimal sense of achievement. The participants classified as *Aimless* were distinguished by their markedly incoherent or confused interviews. Inconsistencies were pervasive, and the subject's discourse and work-related history were difficult to follow. Fifty subjects received EEI classifications (two were unavailable for the interview and one interview could not be transcribed because of a poor tape recording).

The EEI and AAI transcripts were assigned different identification numbers in order to insure blind scoring (two of the four EEI coders were also coders for a subset of the AAI transcripts). All coders were unaware of all other information about the subjects. Interrater agreement for four classifi-

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the fastest subjects cannot attempt every item (Jensen, 1980, p. 135). The Henmon-Nelson meets these criteria (Jensen, 1980), and in this sample, 12 subjects completed 80 or more test items, and seven completed all 90 items.

cations on 36% of the cases ($n = 19$) was 89%, $k = .73$, $p < .01$, for four coders (BO'C, BG, JC, and DT). Classification disagreements were resolved by a third coder. The distribution of the four major classifications was: Integrated, $n = 33$ (66%), Overinvolved, $n = 6$ (12%), Uninvolved, $n = 10$ (20%), and Aimless, $n = 1$ (2%).

Social desirability: The Social Desirability Scale (SDS; Crowne & Marlowe, 1964).—The SDS assesses an individual's tendency to bias self-reports in a way that presents himself or herself in a socially desirable light. The test consists of 33 statements scored on a seven-point Likert scale ranging from strongly agree to strongly disagree. Cronbach's alpha was .58 in this study, showing moderate internal consistency as was found in the sample reported by Bakermans-Kranenberg and van IJzendoorn (1993).

Social adjustment: The Social Adjustment Scale (SAS; Weissman & Paykel, 1974).—The SAS is a semi-structured interview which was designed for use in an epidemiological study of depression in women (Weissman & Paykel, 1974). The SAS assesses adaptive functioning from excellent to severe impairment regardless of occupation and discriminates subjects in psychiatric samples (with both mild and severe disorders) from those in general populations, and subjects with mild psychiatric disorders from those with severe disorders (Bothwell & Weissman, 1977; Mostow & Newberry, 1975; Weissman, Kasl, & Klerman, 1976; Weissman & Paykel, 1974). The global adjustment score derived from the scale has sufficient sensitivity to be used as an assessment of therapeutic outcome (Follette, Alexander, & Follette, 1991; Resnick & Schnicke, 1992; Watkins et al., 1993).

The SAS assesses functioning in the following domains: (1) work/management of finances, (2) social and leisure activities, relationships with (3) spouses, (4) children, and (5) extended families, and (6) overall adjustment. Adjustment in each domain is assessed by asking the subject an average of five questions about her functioning and behavior in the preceding 2 months within the domain, for example, specific activities with friends, arguments with children, instrumental assistance from extended family or spouse, ability to conduct household chores, and pursuit of hobbies. As such, it is considered a measure of broad social adjustment and functioning. Each response within a do-

main is scored on a five-point scale by the interviewer during the interview. Using individual response scores, the subject is given an adjustment score for the domain using a seven-point scale. Upon completing the interview, the interviewer assigns an overall adjustment score on a seven-point scale using all the domain scores and the impression the interviewer has gained of the subject's global functioning (1 = *excellent functioning in all areas*, 7 = *marked or severe maladjustment in all areas*). The global score allows the interviewer to take into account information given by the subject which does not readily fit the domains addressed. For example, obsessive/compulsive behavior is not directly assessed by the interview, but the interviewer can take a report of this behavior into account in the global assessment.

The interviews were audiotaped, and 15 (28%) were scored independently for interrater agreement from the tapes. The agreement for overall adjustment was $r = .76$, $p < .001$, and domain agreement scores were as follows: work, $r = .55$, $p = .04$, social leisure, $r = .65$, $p = .01$, extended family, $r = .78$, $p = .001$, marital, $r = .90$, $p \leq .001$, and parenting, $r = .55$, $p = .04$. This represents one coder's agreement (CC-D) with the six interviewers (MC, MF, OF, YG, GP, HP) who did the original interviews.

Procedure

Participants were recruited through local preschools and from the community by advertisement. The subjects were seen on two occasions. Most interviews were conducted in our laboratory, but a few subjects preferred to be tested at home. The AAI, the assessments of social desirability, and social adjustment interview were completed in the first session. The Employment Experiences Interview and the assessment of intelligence were administered during a second session. The tasks for each session were selected to balance the amount of time the participants spent in each session and to minimize any carryover of discourse style that might result if the AAI and the EEI were administered together. Because the measures involved are quite complex, the amount of work considerable in each session, and the response formats of the various measures very diverse, neither the order of the psychometric measures nor the order of AAI and EEI were considered significant factors in the design. The AAI and the EEI were done by different interviewers. All interviews were conducted by researchers fully trained in AAI inter-

viewing techniques, and two were formally trained in the scoring of the AAI. All assessments were scored blind to the results of the other measures.

Results

One-way analyses of variance (ANOVAs) were used to examine relations of the four AAI classifications to major demographic and discriminant validity variables.[2] We also conducted three theoretically significant planned comparisons: Secure versus All Insecure (dismissing, preoccupied, unresolved), Dismissing versus Preoccupied, and Unresolved versus Other Insecure (dismissing, preoccupied). The discriminant validity of the Secure versus Insecure classifications is central to the attachment-relatedness of AAI classifications. The Dismissing versus Preoccupied comparison addresses the discriminant validity of distinctions among insecure subjects. The Unresolved versus Other Insecure analyses addresses the attachment-relevance of the Unresolved classification. Because one requirement for the Unresolved classification is loss or trauma, its discriminant validity with respect to general social adjustment is of particular importance.

Although most research with the AAI has focused on the discrete attachment classifications (secure, dismissing, preoccupied, and unresolved) and subclassifications, Ffyfe and Waters (1996) have demonstrated that Main and Goldwyn's (1994) discourse coherence scale is highly related to the secure versus insecure dichotomy in the discrete classifications. The secure versus insecure distinction is central to many uses of the AAI. In addition, continuous variables often provide greater resolution than broad classifications. They also lend themselves to a wide range of data analytic strategies that often have greater statistical power than the nonparametric methods most often used with classification data. In light of these considerations, we used Pearson correlations to examine relations of the discourse coherence scale score to the discriminant validity variables.

Demographic Variables

No differences were found among AAI classifications and the demographic variables of age, number of children, work status, or socioeconomic status.

AAI Classifications, Intelligence, and Education

Analyses addressed the relation between AAI classifications and educational level and intelligence scores. There was no significant difference among AAI classifications for years of education or educational level attained.

Analyses of variance addressed the relation between attachment classifications and intelligence test scores, first examining the association with the number of items completed and then number of items correctly answered. No relation was found between AAI classification and number of items completed, suggesting that personal speed in test taking did not differ among the four groups. Nor was any significant difference found among the four AAI classifications in number of items correctly completed, that is, raw IQ scores (see Table 2).

Significant results were found for two of the planned comparisons. Women classified as Secure scored higher than women in the Insecure group. Women classified as Dismissing scored higher on the intelligence test than women classified as Preoccupied. Because all of the variance appeared to be carried by the Preoccupied group, analyses were repeated without the Preoccupied subjects. Results found no differences between the Secure and Insecure subjects in raw scores when the Preoccupied subjects were omitted from analyses. Thus it appears that the significant results were because women in the Preoccupied group had significantly lower IQ scores than women in the other three groups. Because the number of Preoccupied subjects in this sample is small, this issue deserves further study. Nonetheless,

[2] ANOVAs of the discriminant variables were also conducted using the three major classifications. No differences were found between AAI classifications and the demographic variables of age, number of children, work status, or socioeconomic status. Likewise, no significant differences were found among the three groups for scores on global social adjustment or social desirability. An ANOVA of the three classifications with intelligence scores was significant, $F(2, 49) = 3.52$, $p \le .05$. The mean score of Secure subjects ($n = 30$) was 56.2 (SD 14.1), of Dismissing subjects ($n = 16$) was 51.9 (SD 16.0), and of Preoccupied subjects ($n = 6$) was 38.7 (SD 15.1). Post hoc comparisons revealed that the Preoccupied subjects scored significantly lower than subjects classified as Secure, and there was a trend for them to score lower than the Dismissing subjects. Chi-square analysis found no relation between AAI using a three classification system and the EEI classifications.

TABLE 2

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS FOR DISCRIMINANT VALIDITY MEASURES BY AAI CLASSIFICATION

	Adult Attachment Classifications					Planned Comparisons[a]		
	Secure (n = 27)	Dismissing (n = 14)	Preoccupied (n = 4)	Unresolved (n = 8)	F (3, 48)	Secure vs. Insecure	Dismissing vs. Preoccupied	Dismissing and Preoccupied vs. Unresolved
Intelligence	56.1 (15.1)	53.0 (16.9)	38.0 (16.8)	49.2 (10.9)	1.83	4.35*	3.03+	N.S.
Social desirability	143.7 (21.1)	135.1 (14.8)	135.2 (30.2)	140.4 (14.6)	.86	N.S.	N.S.	N.S.
Social adjustment:								
Global	1.5 (1.2)	1.9 (1.0)	2.5 (.6)	2.2 (.7)	3.54*	10.40**	N.S.	N.S.
Work	1.4 (.5)	1.5 (.6)	2.3 (.6)	1.8 (.5)	5.52**	14.03***	6.99*	N.S.
Social/leisure	1.6 (.6)	1.8 (1.0)	2.0 (1.5)	2.4 (.9)	N.S.	N.S.	N.S.	N.S.
Extended family	1.6 (.6)	1.7 (1.0)	3.0 (1.4)	1.9 (.8)	3.15*	5.71*	6.53*	N.S.
Marital	1.6 (1.2)	2.0 (1.4)	2.5 (.8)	1.5 (.8)	N.S.	N.S.	N.S.	N.S.
Parental	1.4 (.6)	1.6 (.6)	2.0 (.5)	1.9 (.8)	N.S.	3.87+	N.S.	N.S.

MEAN SCORES AND (Standard Deviations) FOR

[a] Statistics presented are F values, df 3, 48.
+ $p \leq .10$.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

because the present result is statistically significant and contradicts results from other samples (e.g., Bakermans-Kranenburg & van IJzendoorn, 1993; Rosenstein & Horowitz, 1993; Sagi et al., 1994; Ward et al., 1991), we recommend that IQ be included as a covariate in research with the AAI until the issue is resolved.

AAI Classifications and Discourse Style in the Employment Experience Interview

Before examining the relations between the AAI and Employment Experience Interview (EEI) classifications, the employment history of the women was examined, as was the relation between the EEI and demographic variables and intelligence scores. These analyses were conducted to assess whether the EEI was tapping separate aspects of the subjects' lives from the AAI, as was intended (a particular concern with those who were currently homemakers). All of the subjects had been employed full-time outside the home prior to having children, and currently 26 were working part- or full-time outside the home. On average, the women had held five jobs outside the home. There was no significant difference in the number of jobs held between subjects who were currently employed outside the home and those who were currently homemakers.

The EEI classifications were unrelated to subjects' age or IQ scores, but there was a trend for a relation between EEI classification and average number of years of education, $F(3, 45) = 2.68, p = .058$, Integrated $= 15.6$ years, Overinvolved $= 17.3$ years, Uninvolved $= 13.3$ years, Aimless $= 13.0$ years. Post hoc analyses (Tukey honest significant difference test) revealed that there was a tendency ($p = .09$) for subjects classified as Overinvolved to have more years of education than those classified as Unin-

volved. Coherence on the EEI was related to the years of education reported by the subjects, $r = .31, p < .05$. There was no relation between work status or SES and EEI classification.

Cohen's kappa was used to examine the relation between the AAI and EEI, using four classifications for each interview. No significant relation was found between AAI and EEI classifications for the sample as a whole (see Table 3). In addition, there was no correspondence between the EEI and AAI in the sample of women who were full-time homemakers. The correlation between coherence scores on the two interviews was nonsignificant (see Table 4). The results suggest that the AAI is not measuring a trait-like discourse style.

AAI Classifications and Social Desirability

As predicted, results from ANOVAs and planned comparisons revealed no significant differences in social desirability scores among AAI classifications (see Table 2).

AAI Classifications and Social Adjustment

Ninety-six percent of the subjects received scores of 1, 2, or 3 on the SAS global adjustment scale, indicating excellent to good social adjustment for the sample as a whole. The ANOVA revealed a significant difference among the groups in global adjustment score, and planned comparisons showed that women classified as Secure were given significantly better overall adjustment scores than women classified as Insecure (see Table 2). There were no differences among the insecure groups on overall adjustment scores. Before examining the specific domains of social adjustment, a MANOVA of the domain scores was conducted and found significant, Rao's $R(df 15, 119) = 2.26, p = .008$. Significant differences be-

TABLE 3

AAI AND EEI CORRESPONDENCE

	AAI CLASSIFICATIONS				
	Secure	Dismissing	Preoccupied	Unresolved	Total
EEI classifications:					
Integrated	19	9	2	3	33
Uninvolved	5	2	0	3	10
Overinvolved	2	2	2	0	6
Aimless	0	1	0	0	1
Total	26	14	4	6	50

NOTE.—kappa = .06, N.S.

tween women classified as secure and those classified as insecure were subsequently found in the domains of work and the extended family (see Table 2). Furthermore, women classified as dismissing received significantly better scores in functioning at work and in the extended family than those classified as preoccupied. No differences were found between the subjects classified as unresolved and those in the other two insecure groups.

Because intelligence is a possible contributing factor in social adjustment, we performed an ANCOVA of AAI classification and the overall social adjustment score with IQ as a covariate. Results indicated the relations between AAI classification and social adjustment overall and the domain scores were not significant when IQ was used as a covariate, $F(1, 49) = 2.19$, N.S. Planned comparisons with IQ score used as a covariate found that subjects classified as Secure scored significantly higher than Insecure subjects in global social adjustment, $F(1, 47) = 6.30$, $p = .02$, with no differences among the Insecure subjects. With respect to specific domain scores with IQ factored out, subjects classified as Insecure scored significantly lower than the Secure group, $F(1, 47) = 9.73$, $p = .003$, and the Preoccupied subjects scored lower than Dismissing subjects, $F(1, 47) = 5.86$, $p = .019$, in the domain of work/management of finances.

To examine the size of the effect of attachment status on social adjustment, omega square analyses were conducted. Omega square provides a measure of relative treatment magnitude which is responsive to the strength of association between the variables and is independent of sample size (Keppel, 1982). Thus it provides useful information even when an F score is not significant. Omega square ranges from .00 to 1.00, with a "medium" effect being represented by $\omega^2 = .06$, and a "large" effect by $\omega^2 = .15$ or greater (Keppel, 1982, p. 92). The relation between AAI classification and overall social adjustment score was $\omega^2 = .14$, and with intelligence score factored out, was $\omega^2 = .10$, indicating a moderate relation between social adjustment and AAI classification. These results are consistent with the predicted relation between attachment security and social adjustment. They are not strong enough to suggest a general social adjustment interpretation of the AAI when it is used in nonclinic samples. The relation between general social adjustment and AAI classifications may be very different in clinical samples.

Discriminant Validity of the AAI Discourse Coherence Scale

Because the discourse coherence scale is potentially valuable as a way of scoring adult attachment security as a continuous variable, we examined relations between this summary scale and the discriminant variables discussed above (see Table 4).

There was a relation between coherence scored from the AAI and subject's age

TABLE 4

CORRELATIONS BETWEEN AAI COHERENCE OF TRANSCRIPT AND
DEPENDENT VARIABLES

Dependent Variables ($n = 53$)	AAI Coherence r
Demographics:	
Age	.32*
Years of education	.35*
Intelligence score	.42**
Social desirability	.10
Coherence on EEI	.10
Social adjustment:	
Global	−.46***
Work/financial management	−.49***
Social/leisure	−.30*
Extended family	−.29*
Marital	−.49***
Parental	−.31*

* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

and years of education. There was also a moderate relation between AAI coherence and raw IQ scores. Interestingly, however, the mean scores for coherency of transcript did not differ for subjects classified as Dismissing (coherence = 3.9) versus Preoccupied (coherence = 3.7), suggesting that the ability of subjects in the two groups to give an integrated account of childhood was equally poor. The relation between AAI coherence and social adjustment scale scores was significant for overall social adjustment and for the domains of social adjustment. There was no relation between AAI coherence score and scores of social desirability.

Last, to examine the relation between discourse style on another topic and AAI coherence, a one-way ANOVA was done using the four classifications from the EEI and the AAI coherence scores. No significant relation was found between EEI classification and AAI coherence. Planned comparisons of Secure versus Other, Uninvolved versus Overinvolved, and Aimless versus Uninvolved plus Overinvolved were also not significant. The correlation between AAI coherence score and EEI coherence score was not significant.

Discussion

In summary, the relations between the AAI classifications and assessments of discourse style and social desirability were not significant. Social adjustment did show a relation to AAI classifications, and, contrary to expectations, the Preoccupied group differed from the other classifications in their raw scores on the intelligence test. Significant relations were also found between AAI coherence of transcript scores and a number of variables, including subjects' age, years of education, intelligence scores, and social adjustment.

Attachment theory and empirical evidence suggest a relation between secure attachment and confident exploration and social competence. We were interested in the relation between adult attachment status and the broad construct of social adjustment in this sample of women who overall showed good to excellent functioning, and thus adaptive behavior across a variety of domains was assessed. The examination of effect size showed a moderate relation between the AAI classifications and social adjustment even when the effect of intelligence was taken into account. This finding is consistent with the idea that the attachment system is related to social competence and adaptation even when a broad definition of adjustment is used and psychopathology is not a factor. However, with regard to the question of the discriminant validity of the AAI, it appears that the AAI is not equivalent to a measure of social adjustment.

The finding that intelligence scores were related to AAI classification was unexpected and contrasts with findings from other studies. One possible explanation lies in the assessment of intelligence. The intelligence assessment used in the study is a well-validated measure, but it has a heavy emphasis on verbal abilities and can be viewed primarily as a measure of scholastic potential. Unfortunately, the nature of the test does not allow for diagnostic breakdown. We have used the test in a large sample of engaged couples, and no relation was found between intelligence and attachment classification (Treboux, Crowell, & Waters, 1994), suggesting a sample specific result. Subjects classified as Preoccupied are relatively rare (van IJzendoorn & Bakermans-Kranenburg, 1996), and in some circumstances, they may be less capable than subjects in other groups, much as Insecure/resistant children have been found to be less socially competent than Secure or Insecure/avoidant children and show the lowest levels of mastery motivation (Maslin-Cole & Spieker, 1990; Sroufe, 1983).

A second finding of interest with respect to intelligence is the correlation between coherence of transcript scores and intelligence scores and years of education. The correlation is not great enough to suggest that the AAI or its coherency scale are alternative ways to measure intelligence, but it is not entirely surprising that the ability to speak in an organized way might be related to verbal intelligence and education (Liu et al., 1995).

As noted above, our findings with respect to intelligence testing contrast with the published findings of Bakermans-Kranenburg and van IJzendoorn (1993) and Sagi and colleagues (1994), who report on Dutch and Israeli samples, respectively. A direct comparison of our study to these two studies is difficult because of differences across samples in assessments of intelligence, in reporting of essential information which would facilitate comparisons across studies such as the variability of scores, means, and standard deviations, and finally, in the analyses selected. For example, the

other two samples are non-native-English speaking. Intelligence tests in one case were standardized (Bakermans-Kranenburg & van IJzendoorn, 1993), but in the other, standardized intelligence tests were not available for the population so scores on tests for admission to university were used in analyses (Sagi et al., 1994). The Israeli study utilized a sample purposely selected for high intelligence, and mean scores for the four groups were not reported (Sagi et al., 1994), and the range of scores was not reported for either sample. Neither study reported the relation of coherence of transcript to intelligence (in part because the classifications were viewed as the "center of theoretical and empirical studies on adult attachment" (Bakermans-Kranenburg & van IJzendoorn, 1993, p. 873). Despite differences among the studies, taken together they indicate that the AAI is certainly not primarily a measure of mental ability. Process level analyses of the role mental abilities play in adults' abilities to present coherent discourses about their attachment histories would be useful additions to our knowledge of the AAI's discriminant validity and to understanding of how attachment representations are related to social perception and behavior. In the meantime, we recommend including a measure of mental ability as a covariate in research with the AAI.

No relation was found between AAI classifications and social desirability ratings. The findings were consistent with those of Bakermans-Kranenburg and van IJzendoorn (1993). It appears that subjects are not able to predict what constitutes a "good" response to an AAI question and therefore are not able to select one that is socially desirable, even if so inclined. Thus it seems that subjects are responding to AAI questions with the biases inherent in their working models of attachment.

Our results indicate that the AAI is not merely a measure of trait-like discourse style. However, a number of the discriminant and demographic variables related to AAI coherence of transcript scores. The discourse coherence concept is derived from analyses of conversational pragmatics (Grice, 1975) and reflects the individual's capacity to be believable (no factual or logical inconsistencies), give sufficient but not excessive responses to the questions, and to be clear, orderly, and relevant. Our findings suggest that coherence of transcript, while highly related to attachment security, is also related to other constructs or factors which

exert an impact on language, thought, and adaptive functioning, that is, age, education, and intelligence. The findings support the idea that despite its high correlation with overall security, the coherence of transcript score should not be considered equivalent to the classification system (Main & Goldwyn, 1991). Main and Goldwyn are in the early stages of developing a "coherence of mind" scale which takes into account "unusual beliefs [which could reflect incoherence of thought, but which] may be stated coherently, cooperatively, and from the viewpoint of the subject, truthfully" (1994, p. 90). As such this scale attempts to separate out abilities which may be related to intelligence or experience but which are not directly related to attachment organization. Future studies, especially in collaboration with cognitive developmental psychologists, should investigate the capacity to give a coherent narrative, its relation to attachment organization and cognitive abilities, and the influence of experience and emotion on the development of those abilities (Oppenheim & Waters, 1995).

In conclusion, the Adult Attachment Interview classifications were differentiated in this study from factors which relate to adaptation, language usage, and thought but which are not specific to the attachment system, in particular, social desirability and discourse style. Although sensitive to social adaptation, the AAI does not appear to be simply a complex method of assessing social adjustment. The relation between the AAI and intelligence in this study suggests that in some samples there may be an interesting correspondence, but overall the results of work to date suggest that the AAI is not equivalent to an assessment of intelligence. Although new issues regarding the discriminant validity of the AAI will arise as the measure is applied in new populations and new research designs, the present study establishes a significant degree of discriminant validity for the AAI in an important population.

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